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ON THE GENUS PHÆDON (COLEOPTERA)

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The attention of coleopterists has recently been called to this Chrysomelid genus by two papers in successive numbers of the PAN-PACIFIC ENTOMOLOGIST (July and October, 1928) by Mr. Melville H. Hatch of the University of Washington. In the first of these articles five new species are described, and in the second four more are added. Tables are given for connecting these up with our previously known species and several of the European species are also included.

Having a certain degree of familiarity with the genus through previous studies, I was at once led to doubt the validity of some of the new species, and consequently took steps to ascertain just what Mr. Hatch had in hand. Through the kindness of the author himself, Dr. Van Dyke, Mr. Carr, and Mr. Dietrich, I have been enabled to examine either types or paratypes of all the supposed new forms, and submit the following conclusions:

P. microreticulatus Hatch and *P. dietrichi* Hatch are both assignable to *viridis* Melsh. The former is more nearly typical in elytral sculpture, but both are well within the limits of this variable species and are so completely gradationally connected that a varietal name is useless. Hatch's statement that the punctures of the head and pronotum are subequal in *dietrichi* is inaccurate, the head punctures being really distinctly coarser than those of the median parts of the thorax and in almost the average degree.

P. punctatus Hatch and *P. vandykei* Hatch are merely forms of *prasinella* in which there is a greater disparity between the strial and interstrial punctures than is typical. There is every possible intermediate step between these and the type. As in several other species color is here very variable and of absolutely no specific significance.

P. purpurescens Hatch differs in no way from *purpurea* Linell.

P. huachucæ Hatch is identical with *cyanescens* Stål. This fact is established by comparison with authentic examples in the Biologia material at the Museum of Comparative Zoölogy at Cambridge. The species ranges through Central America and Mexico and crosses our border into Arizona.

P. carri Hatch. I am unable to separate this from *cochleariæ* Fab. Hatch's type is described as "metallic cupreous," but he mentions blue specimens. The majority of those seen by me have been piceous with bronze or faint greenish luster. As usual in this genus, color counts for nothing.

P. vancouverensis Hatch. The characters given by Hatch are quite insufficient to separate this from *oviformis* in view of the marked inconstancy of the latter in color and elytral sculpture. I have seen only a single paratype of *vancouverensis* and this, while not quite like any in my series of *oviformis,* differs from some of them no more than they differ among themselves.

P. niger Hatch. This was based on a unique example with convex elytral interspaces. I have seen the type and it appears to me to be an abnormal specimen. In his October article Hatch mentions the discovery of a second specimen of *niger.* In this, which I have also seen, the elytral intervals are nearly flat, but it is somewhat distorted, perhaps from immaturity, and is not a good example on which to base an opinion. *Niger* may therefore best be let alone until we have sufficient normal specimens upon which to form a conclusion.

To recapitulate: of the nine species described by Mr. Hatch as new eight are referable to previously described species, the only possibility of doubt being in the case of *vancouverensis,* while the ninth is based on a probably abnormal unique and its status is therefore doubtful.

With no shadow of personal feeling or any desire to indulge in captious criticism it is impossible to characterize this otherwise than as poor taxonomic work. Aside from individual tendencies to exaggerate the importance of small differences, there are two factors which are largely responsible for faulty or indifferent taxonomic work: first, too much haste or, to put it otherwise, the failure or unwillingness of an author to take the time necessary to familiarize himself with his subject; and again, too rigid or too literal interpretation of the older descriptions. Taxonomic papers cannot be dashed off "while

you wait." Even the shortest of them demand an amount of painstaking investigation often seemingly wholly incommensurate with the results. None of us are entirely free from these shortcomings, but in the present instance the resulting percentage of error is excessive.

Of our five previously described native species of Phædon, Mr. Hatch in his first paper admits that four are unknown to him in nature. For three of these he goes to Crotch, whose characterizations average about one line each, and for the fourth (*purpureus*) he consults the original description. Crotch is only relatively correct in saying that *viridis* Melsh. has no humeral callus. The callus is really present though weak. Hatch actually had in hand typical examples of *viridis,* but did not recognize it. His conclusion that because there seemed to him to be no examples of *viridis* among the New York specimens before him the species must therefore be removed from the New York State list is, of course, a *non sequitur.*

In his description of *purpurea* Linell used the term "alutaceous" in speaking of the elytral sculpture where transversely rugulose would have been more appropriate. This and the unwarrantable assumption that Linell's words "clypeal suture distinct" meant that the suture was of equal depth throughout, led to the redescription of Linell's species under the name *purpurescens.* That the two names cover a single species I am positive after examining a paratype of *purpurescens* in connection with specimens in my own collection previously compared with the type of *purpurea.*

There are, of course, many instances where comparisons with types or typical specimens are impossible or so difficult as to be impracticable; in such event recourse to the original or some other description is the only alternative. In the two cases mentioned above, however, with a little time and effort it would not have been difficult to have secured authentic specimens for study or to have had comparisons made with such and thus have avoided unnecessary error.

P. æruginosus Suffr. It will be observed that this name, long held to be a varietal form of *viridis* following the opinion of Crotch, has in the Leng list been advanced to full specific standing, though on whose authority I know not. The precise status of *æruginosus* has never been known to American coleopterists,

and it is with considerable satisfaction that I am now able to clear up this doubtful question. Through the kind offices of Dr. Walther Horn, Dr. Zimmer of the Berlin Museum has obligingly sent me Suffrian's type for examination. It proves to differ in no way from ordinary practically typical examples of *viridis* and must be regarded as a straight synonym thereof.

The following table includes all our native species as I interpret them. I have ventured to propose one new name.

The first character used, viz., the presence or absence of a series of larger punctures on the second elytral interval, we owe to Mr. Hatch's observation. It appears to be remarkably constant and serves well to divide our species into two subequal groups. These punctures are widely spaced, about four to six in number and, so far as I have noticed, are all included within the basal half of the interval.

It will be noticed that in all of Hatch's diagnoses he describes the elytra as eight-punctate striate, the marginal interval with a series of striaform punctures. These latter are not really interstitial punctures but constitute morphologically the ninth stria, which is more feebly developed in Phædon than in other Chrysomelid genera having regularly punctate striate elytra.

TABLE OF SPECIES

Second elytral interval without a subbasal series of widely spaced larger punctures.

Head and pronotum finely alutaceous or microreticulate, tarsal claws smaller than elsewhere in the genus.

Head coarsely punctate, the punctures distinctly larger than those of the median parts of the pronotum; ventral segments coarsely punctate; size larger, averaging about 3.5 mm. ..... *viridis*

Head more finely and sparsely punctate, the punctures not or but very slightly coarser than those of the pronotum, which are nearly uniform in size from side to side; ventral segments more sparsely and very finely punctate; size smaller, averaging less than 3 mm. ..... *uniformis*

Head and pronotum not perceptibly alutaceous, usually visibly but very finely micropunctulate between the larger punctures.

Form distinctly rotundate, deep purple or violaceous varying to greenish, ventral surface very finely punctate.. *cyanescens*

Form more parallel, oblong oval.

Interstitial punctures of elytra sparse and very minute; color purpureo-violaceous, the thorax usually greenish; ventral surface coarsely punctured; size large, over 4 mm. ..... *purpurea*

Interstitial punctures of elytra always strong and distinct and in typical examples nearly as large as those of the striæ; size smaller, rarely as much as 3.5 mm. ..... *prasinella*

Second elytral interval with a widely spaced subbasal series of larger punctures.

Elytral intervals transversely subrugulose in varying degree, as a rule more distinctly so toward the sides ..... *oviformis*

Elytra not perceptibly transversely subrugulose.

Clypeal suture nearly equally impressed throughout; antennæ entirely black; humeral callus stronger, ventral surface distinctly microreticulate, the last segment commonly entirely pale; size as a rule somewhat larger ..... *armoraciæ*

Clypeal suture feeble at middle, more strongly impressed at sides; basal two joints of antennæ more or less pale beneath; humeral callus less strong; ventral surface not or scarcely visibly microreticulate, the last segment black or with, at most, a narrow pale apical border; tarsal claws a little larger; color typically blue, but with us more commonly æneopiceous ..... *cochleariæ*

1. PHÆDON VIRIDIS Melsh.

(*æruginosus* Suffr.; *microreticulatus* Hatch; *dietrichi* Hatch)

This rotundate oval, strongly convex, rather large species is widely dispersed from Quebec and Ontario to Florida and New Mexico. There are at present two examples only in the Melsheimer collection, the one bearing the name label is dull bronze with feeble greenish luster, the other brighter green, but Melsheimer also mentions cupreous specimens; other color varieties are dark bronze with greenish thorax, green with nigroviolaceous thorax, deep blue or violaceous with black thorax. The green and blue specimens are mostly from the western and southwestern states (Illinois, Arkansas, Texas, and New Mexico). I have seen only two green examples from Pennsylvania, and none as yet from New England. There is also much variation in sculpture more especially in the microreticulation of the elytra. In the Melsheimer type this alutaceous ground sculpture of the elytra is distinct throughout, but there is a complete gradation through less distinct and partial

to complete absence of such sculpture. The blue and green examples are commonly though not always smoother than the bronze ones. The fact that the tarsal claws are unusually small in this species seems not to have before been noticed, and this combined with the bodily form and alutaceous thorax differentiates it with certainty from all other species but the following, which see.

2. **Phædon uniformis** Fall, n. sp.

Very closely allied to the preceding species, but thus far definitely separable by the tabular characters. In the dozen or more examples seen the color is uniformly æneopiceous, the alutaceous sculpture of the elytra very fine but detectable. The length in the northern specimens varies from 2.4 to 3 mm., but in a single example from Georgia in the Bowditch collection it is 3.2 mm. With the exception of this Georgia specimen all examples seen by me are from Massachusetts (Wilbraham, Brookline, Framingham, Natick) and New Jersey (Newark and Irvington). The type is a Wilbraham specimen contributed by Mr. Liebeck; it bears date August 2.

This form is separated under the name *æruginosus* in the Bowditch collection.

3. PHÆDON CYANESCENS Stål
(*huachucæ* Hatch)

Broadly oval, color usually violaceous, but varying to deep blue-green. Head and thorax moderately subequally punctate with extremely minute interstitial punctures and faint traces of microreticulation. Elytral intervals remotely minutely punctulate and very finely transversely rugulose. Ventral surface polished and not perceptibly microreticulate at middle, feebly so at sides.

Length 3.2 to 4 mm.; width 2.3 to 2.9 mm.

Southern Arizona (Baboquivari, Chiricahua and Huachuca mountains); New Mexico (Beulah).

4. PHÆDON PURPUREA Linell
(*purpurescens* Hatch)

This is our largest species; this, together with the more oblong form and coarser punctuation and microreticulation of the ventral surface, at once distinguishes it from *cyanescens*

which occurs in the same general region. Linell's type was from southwestern Utah. The six examples before me are from the mountains of southern Arizona (Baboquivari; Chiricahua).

5. Phædon prasinella Lec.

(*punctatus* Hatch; *vandykei* Hatch)

Widely dispersed in the Pacific Coast states from Washington to southern California. I have examined in different collections some seventy examples of this species from all parts of its range. These differ so prodigiously and gradually in color, outline, and sculpture, that an attempt to formulate definite varieties on such inconstant characters seems wholly futile.

6. Phædon oviformis Lec.

(? *vancouverensis* Hatch)

Quite as variable in color as the preceding species. The thorax is almost invariably æneous, but the elytra may be cupreous (type), igneous, dark green, bright green, violaceous or nearly black. I have never seen a distinctly blue specimen. The transverse rugulosity of the elytra may be very evident throughout or it may be virtually absent on the disk and perceptible only near the sides. If there is doubt as to the presence of this rugulosity, the distinctly alutaceous ventral surface and slightly smaller claws will separate the present species from *cochleariæ,* and the much sparser punctulation of the elytral interspaces will distinguish it from *armoraciæ*.

Oviformis has a very wide distribution, ranging from Alaska to New England and descending in the Rocky Mountains to New Mexico. It is known to me from Fort Yukon, Alaska; British Columbia, Washington, California, Colorado, New Mexico (Las Vegas), Manitoba, Ontario, Quebec (Montreal), Maine (Monmouth, also "wash-up on Androscoggin River"—Frost).

7. Phædon armoraciæ L.

Both this and *cochleariæ* are very common European species and have long been known from our own fauna though generally with some degree of uncertainty. So far as seen our specimens are either of the typical deep blue color, the prevailing form in the East, or of a very dark green or greenish black

tint, these latter from western Canada. In addition to the characters given in the table, *armoraciæ* is generally distinguishable from *cochleariæ* by its larger size, and the much more numerous minute punctures of the elytral intervals.

I have seen examples of this species from Maine, Massachusetts, New York, Quebec (Montreal), Colorado (Florissant), Manitoba (Winnipeg, Piquitenay River), Alberta (Edmonton) and British Columbia (Terrace). Sherman has recorded it from Labrador.

8. Phædon cochleariæ Fab.
(*carri* Hatch)

The most notable single character of *cochleariæ* is the relatively large tarsal claws, *armoraciæ* approaching it most nearly in this respect. When comparison is made with *viridis* the disparity in size of the claws is quite marked. European specimens are normally green or blue, but such are comparatively rare with us. The greater number of American examples seen by me are æneopiceous. Hatch's type of *carri* is described as cupreous, but he also mentions greenish specimens. This and *uniformis* are on the average our smallest species, rarely more than slightly exceeding 3 mm. in length. Hatch in his description of *carri* gives the single measurement 3.5 mm., but two of his paratypes before me measure only 2.7 and 3.2 mm., respectively.

Like *armoraciæ* the present species is essentially one of northern distribution. I have seen specimens from Massachusetts, New York (vicinity of Ithaca), Quebec (Montreal), Ontario (Toronto), Minnesota (Duluth—both blue and bronze forms), Manitoba (Aweme), Alberta (Edmonton), Utah (Parowan Mountains, 10,000 feet).

9. Phædon niger Hatch

I have not included this in the foregoing table for reasons given on a preceding page. Until more certainly normal specimens are forthcoming it is better to suspend judgment. The type is from Stickney Lake, Snohomish County, Washington, and was collected by Kincaid.